

Laryngospasm in Children Anesthesiologist's Nightmare: Case Report

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Abstract: *Perioperative laryngospasm is an anesthetic emergency. It is responsible for a significant number of complications ranging from hypoxia, bradycardia, bronchial aspiration, negative pressure pulmonary edema and / or cardiac arrest. It is a protective closure reflex of the glottis. Multiple factors have been attributed to its cause. Management using different medications and maneuvers has been resorted to. Various instances of laryngospasm with different situations and different methods of avoiding and overcoming it have been reviewed.*

Keywords: Laryngospasm, upper airway, risk factors, prevention and treatment

1. Introduction

Laryngospasm is defined as the sustained closure of the vocal cords. It is a primitive protective airway reflex, which happens to safeguard the integrity of the airway by protecting it from tracheobronchial aspiration. It is also defined as an exaggerated response of the closure reflex or glottic muscle spasm. Perioperative laryngospasm is an anesthetic emergency that is still responsible for significant morbidity and mortality in pediatric patients. Once the diagnosis has been made, the main goals are identifying and removing the offending stimulus, applying airway maneuvers to open the airway, and administering anesthetic agents if the obstruction is not relieved. Laryngospasm is characterized by severe hypoxia (61%), bradycardia (6%), obstructive pulmonary edema (4%), cardiac arrest (0.5%), pulmonary aspiration (3%), arrhythmias and death.² The incidence is the highest in the child between one and three months of age. In the first nine years of age, the incidence of laryngospasm is 1.74%.³

Common triggering factors includes hyperactive airway like upper respiratory tract infection, painful stimulation, insufficient plane of anaesthesia and surgery related factors. There is a very close association between laryngospasm and type of surgery. The surgical procedures of the upper airway, upper gastrointestinal endoscopy, appendectomy and hypospadias repair, or inferior urological surgery such as cystoscopy, they also have a high possibility of causing laryngospasm. Lower urinary tract procedures require a deep anesthetic plane and adequate intraoperative anesthesia, since urethral manipulation can precipitate laryngospasm, due to the activation of the Breuer - Lockhart reflex.⁴⁻⁵

2. Case Report

A 7 year old boy of body weight 20 kg presented with pain abdomen in emergency department; further diagnosed as acute appendicitis was planned for emergency appendectomy. He had been fasting for the past 6 h. Preoperative evaluation was normal with vitals: blood pressure 105/60 mmHg, heart rate 115 beats/min, pulse oximetry [SpO₂] 99% on room air. General anesthesia with

cuffed endotracheal intubation was planned as child was non compliant and parents refused to give informed consent for regional anaesthesia. Patient was preoxygenated with 100% oxygen for 3 minutes; premedication was given simultaneously with Inj Fentanyl 2mcg/kg and Inj Midazolam 0.03mg/kg. Anesthesia was induced by a resident under the direct supervision of a senior anesthesiologist with Inj. Propofol 2mg/kg and Inj. Atracurium 0.5mg/kg. Under direct laryngoscopy, airway was secured with cuffed endotracheal tube of size 6 mm ID and fixed at 19 cm after confirming bilateral equal air entry. Intraoperative period was uneventful and extubation was successful. During emergence phase, urinary bladder was found to be distended and catheterization was planned for emptying the bladder.

During foley's catheterization, SpO₂ dropped rapidly from 99% to 75%, associated with a decrease in heart rate from 115 to 65 beats/min; along with airway obstruction with inspiratory stridor and suprasternal retraction. An episode of laryngospasm was immediately suspected. Despite a jaw thrust maneuver, Larson maneuver, positive pressure ventilation with 100% Oxygen, and administration of two bolus doses of IV propofol (0.6 mg/kg), the obstruction was not relieved and SpO₂ decreased to 65%. A 0.2 - mg IV bolus dose of atropine was injected and IV succinylcholine was given at a dose of 50 mg, followed by tracheal intubation. Thereafter, patient was monitored and vitals remain stable. Patient was again extubated successfully and monitored in PACU. Postoperative recovery was uneventful and shifted to respective ward.

3. Discussion

The first step of laryngospasm management is prevention. Awareness about the various precipitating factors which increase the risk of laryngospasm is necessary. History of prior anaesthesia, complication, respiratory problems and surgeries should be noted. Patient should be intubated in deeper plane of anaesthesia. Extubation can be tried with various medications. If this finds no avail, resort to using succinylcholine should be made, if not contraindicated. After laryngospasm, sign of aspiration, pulmonary edema, must be

sought and treated. Effective management of laryngospasm in children requires appropriate diagnosis followed by prompt and aggressive management.

4. Conclusion

The most important issue in laryngospasm is its prevention. The identification of the risk factors in susceptible patients can help us to avoid the obstruction of the airway. It is a priority to allow all manoeuvres that can contribute to its prevention. If the laryngeal spasm has already been established, treatment with propofol in sub hypnotic doses offers greater advantages than succinylcholine, helps to break the spasm without myocardial depression. The administration of muscle relaxants and reintubation may be necessary advanced ways to solve the problem. Obstructive pulmonary oedema and bronchoaspiration are two of the most frequent complications that can occur during the period of anaesthesia.

Declaration of Conflicting Interests: None

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